

# **The Pegasus, The Dragon, and Air Power: Winged Myths?**

A Monograph  
by  
Major Henry A. Arnold  
Infantry

School of Advanced Military Studies  
United States Army Command and General Staff College  
Fort Leavenworth, Kansas

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MONOGRAPH APPROVAL

Major Henry A. Arnold

Title of Monograph: *The Pegasus, The Dragon, and Air Power: Winged Myths?*

Approved by:

Richard M. Zink  
LTC Richard M. Zink, MA

Monograph Director

Danny M. Davis  
COL Danny M. Davis, MA, MMAS

Director, School of Advanced  
Military Studies

Philip J. Brookes  
Philip J. Brookes, Ph.D.

Director, Graduate Degree  
Program

Accepted this 21st Day of May 1998

## **ABSTRACT**

THE PEGASUS, THE DRAGON, AND AIR POWER: WINGED MYTHS?  
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This monograph addresses the concept that air power can win a war alone. It reviews key air power theorists who have had a significant impact on U.S. air power thought in order to understand the theoretical basis for the idea that air power can win a war alone. The monograph then reviews several air campaigns from World War II to the present to determine if there is any evidence to support the theory that a war can be won solely through air power.

The monograph argues that air power is not capable of delivering decision alone. It also argues that air power is not the preeminent arm of the U.S. military, but is a system within a system that is the U.S. military.

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## **I. Introduction**

The advent of military aircraft over the battlefields of World War I created a new dimension in warfare. Men saw much potential in a weapon that could fly over the stagnated battle lines to carry the war deep into enemy territory. The ability to strike an enemy's reserves, destroy his industry, and attack his civilian population without going through his army first presented some obvious advantages. To some, such a capability offered the possibility of quickly winning a war without the heavy slaughter of trench warfare the world experienced from 1914 to 1918. How to employ such a weapon resulted in various theories on air power, and some theorists developed the provocative notion that war could be won from the air alone.

The idea that a single arm can prevail is not a new theory. However, some still hold that air power can win wars by itself in present and future conflicts. This position that a single arm is capable of forcing a decision on its own may be difficult to maintain given the current U.S. military doctrine of employing combined arms in a joint environment. This idea may be based on the genuine belief that air power can actually deliver decision by itself, or it may be a parochial attempt to obtain a larger share of the budgetary pie. In either case, is there conclusive evidence from current and past operations to support the belief that air power can win a war alone?

This issue is important because the armed forces of the United States have evolved in their respective doctrines to embrace the concept that no service will fight alone. This means that the U.S. military will conduct warfare at the joint level. Fighting wars at the joint level requires planners and commanders to maintain a team player

attitude, and recognize the true capabilities and limitations of their respective services.

The U.S., as the world's only super power, faces a myriad of threats and military obligations on a global level. In order to meet such a challenge, the U.S. must be able to respond across the entire spectrum of conflict from low intensity peace operations to high intensity war with a peer opponent. An attempt to suggest that a single arm can prevail on its own may prove difficult to justify.

This monograph asks the primary research question: Can air power win a war by itself? This question is the central theme of the monograph, but there are two supporting research questions that are also key in determining if war can be won from air alone. The first asks if a nation can win a war without superior air power. The second asks if the will of a nation to fight can be broken by air attack. The monograph will study the theoretical concepts of these issues, and then look for historical evidence that supports or refutes them.

The scope of this monograph is purposely limited in order to keep the size of the monograph at a manageable level. There are many air power theorists available to research for this study, but the monograph will limit discussion to those who have had a significant impact on U.S. air power thought. Furthermore, the discussion of these theorists will be limited to their positions on the issue that air power can win a war by itself. A holistic view of these theorists could conceivably fill the volume of this monograph without ever answering the research questions. Therefore, the author must assume that the reader already possesses a general knowledge of air power theory and the key contributions of selected significant air power theorists. The monograph will not

discuss nuclear weapons in depth. Any discussion of the strategic air campaign against Japan in World War II must include an analysis of the impact of the atomic bombs dropped on Hiroshima and Nagasaki. However, nuclear weapons have not been used since then in a conflict, so there are only theoretical concepts on nuclear warfare with no historical precedents to support or refute them. Military theorists such as Bernard Brodie and Geoffrey Blainey point out the deterrent capability of nuclear weapons based on their massive destructive power, which would seemingly make such a war pointless. At any rate, the discussion of nuclear weapons and their ability to win wars or coerce nations alone constitutes another monograph itself. Finally, the monograph will not discuss the air doctrine of the various U.S. services.

The intended audience for this monograph is broad. It ranges from planners who must design operational or strategic campaigns to policy makers who must decide on feasible options for employment of U.S. military might. They must understand the realistic capabilities and limitations of air power so that this aspect of the U.S. arsenal is neither overestimated nor underestimated.

## **II. The Prophets of Icarus**

This chapter will discuss several air power theorists who have had a significant impact on U.S. air thought. This will not be a holistic review of their contributions, but a focused view of their positions on the concept that war can be won from the air alone. The theorists this chapter will focus on are Giulio Douhet, Alexander de Seversky, William “Billy” Mitchell, and John Warden. Following the discussion of these theorists, this chapter will then conduct a brief analysis of their theoretical positions that will

include a comparison and contrast. This analysis will also include a discussion on the meaning of “national will” and what entails “breaking it.”

#### Giulio Douhet

Giulio Douhet was an Italian army officer who wrote extensively about the possibilities of air power during and immediately after the First World War. Douhet’s belief that the purpose of the air force is to destroy the opposing air force and gain command of the sky has been echoed by many theorists, and is indeed the central theme of air force doctrine of most nations:

I have always maintained that the essential purpose of an Air Force is to conquer command of the air by first wiping out the enemy’s air forces.<sup>1</sup>

He is well known for his belief of the primacy of the bomber over all other aircraft, because he believed that the strength of an air force is strategic rather than tactical. He did not advocate the use of aircraft in a tactical role to support ground forces. He referred to such aircraft as “auxiliary aviation,” and considered the use of aircraft for such a purpose as “worthless, superfluous, and harmful.”<sup>2</sup> He advocated the reduction in size and importance of the army and navy in favor of a massive independent air force. Douhet proposed that a war could be won from the air in a matter of days, relegating the army to initially defending the borders and then occupying the defeated enemy. The navy’s contribution would be similar to the army’s in that it was to defend the coast line until the air force defeated the enemy:

Once a nation has been conquered from the air it may be subjected to such moral torture that it would be obliged to cry ‘enough’ *before* the war could be decided on the surface.<sup>3</sup>

Douhet firmly believed that there would be no need to defeat enemy surface forces once the enemy air force had been destroyed.

Douhet envisioned only total war when developing his theory. The aircraft provided the ability to strike at an enemy's population, industry, and infrastructure. He believed that such targets should be attacked to destroy the will of the nation to continue the war. This is how he described this phenomenon:

The prevailing forms of social organization have given war a character of national totality- that is, the entire population and all the resources of a nation are sucked into the maw of war....There will be no distinction any longer between soldiers and civilians.<sup>4</sup>

Douhet saw no distinction between the soldiers and civilians of an enemy nation. He proposed that enemy population centers should be bombed with chemicals and incendiaries. He saw no moral dilemma in attacking civilians. Like Clausewitz, he saw war as a battle of wills:

War is a conflict between two wills basically opposed one to the another.<sup>5</sup>

A large part of winning the national battle of wills focused on the population, and its moral ability to continue to fight. Douhet certainly advocated attacking the enemy's armed forces from the air by destroying its lines of communications, reserves, depots, etc., but if the will of the populous could be successfully attacked, the enemy would capitulate without the need for a ground war. Douhet explained his rationale like this:

How could a country go on living and working under this constant threat, oppressed by the nightmare of imminent destruction and death? How indeed! We should always keep in mind that aerial offensives can be directed not only against objectives of least physical resistance, but against those of least moral resistance as well. For instance, an infantry regiment in a shattered trench may still be capable of some resistance even after losing two-thirds of its effectives; but when the working personnel of a factory sees one of its machine shops destroyed, even with a minimum loss of life, it quickly breaks up and ceases to function.<sup>6</sup>

He prophesied that the result would be an angry and scared populous that would rise up and demand the government to accept the terms of the enemy. At the time that Douhet wrote the above paragraph, World War I bombers were able to avoid fighter aircraft and most antiaircraft weapon systems. He did not anticipate the technological advances that would take place in the twenty years leading up to World War II that would make unrelenting air attack difficult against a peer opponent.

### De Seversky

Alexander de Seversky was very clear about his belief that air power was superior to ground and naval power. Like Douhet, he witnessed first hand the seemingly endless slaughter of trench warfare in World War I, and saw in air power the opportunity to avoid such scenes in the future. De Seversky believed it was folly to continue to invest in surface warfare forces and systems in the age of air power. He made this comment on France's post World War I defense policy:

The Maginot line was a tomb for a nation that refused to look skyward.<sup>7</sup>

De Seversky saw strategic air power as superior to tactical air power. Using the Nazi invasions of Poland and France as models, he saw the dominance of air power over other arms. In *Victory Through Air Power*, published in 1942, he stated that although war could not be won from the air alone, it was the dominant arm. Just how dominant he viewed air power is illustrated by this comment from the book:

A country will surrender once it loses its air force to an enemy that can devastate it at will.<sup>8</sup>

However, de Seversky had changed his tone by 1950 when he wrote *Survival Through Air Power*. In this book, he called for significantly reduced land and sea forces since the air force could win a war alone. He saw the army as fulfilling a constabulary role that would be used to occupy a prostrate enemy, keep order in the U.S. while it was under air attack, and guard air and missile bases. He saw naval forces as useless in the face of superior air power, and envisioned their role being more like that of the Coast Guard.

De Seversky did not see the will of the people as a worthy target for attack by air power. This was not for humanitarian reasons. He based this conclusion on World War II examples where British and German resolve failed to be destroyed by terror bombing campaigns that specifically targeted the civilians:

It had been generally assumed that aerial bombardment would quickly shatter popular morale, causing deep civilian reactions, possibly even nervous derangements on a disastrous scale. The progress of this war has tended to indicate that this expectation was unfounded.....On the contrary, it now seems clear that despite large casualties and impressive physical destruction, civilians can “take it.” Provided they have the necessary patriotism and will to fight, they can adjust themselves to the threats and sacrifices much more readily than we had foreseen. On the whole, indeed, armed forces have been more quickly demoralized by air power than unarmed city dwellers.<sup>9</sup>

De Seversky saw a nation’s industry and infrastructure as key strategic targets. Once an air force gained command of the air by destroying the enemy air force, the enemy ability to equip, arm, fuel, and feed its forces could be destroyed by attacking his industry and infrastructure. He believed that, under such circumstances, an enemy would not be capable of resisting further, and would be forced to capitulate without the need for a fight on the ground:

Having knocked the weapons out of his hands and reduced the enemy to impotence, we can starve and beat him into submission through air power.<sup>10</sup>

### Mitchell

William “Billy” Mitchell was another air power theorist who saw air power as a means of escaping or reducing the experience of trench warfare from 1914-1918. The profound effect World War I had on him is evident in this quote from his memoirs:

A very significant thing to me was that we could cross the lines of these contending armies in a few minutes in our airplane, whereas the armies had been locked in the struggle, immovable, powerless to advance, for three years. To even stick one’s head over the top of a trench invited death. This whole area over which the Germans and French battled was not more than sixty miles across. It was as though they kept knocking their heads against a stone wall, until their brains were dashed out. They got nowhere, as far as ending the war was concerned.<sup>11</sup>

During World War I, he initially saw air power as an offensive arm that had the primary task to destroy the enemy air force and achieve command of the air. Having won command of the air, air power supported or complemented the other arms of a nation in defeating the enemy more rapidly. This included attacking the enemy army as well as his population:

The air service of an army is one of its offensive arms. Alone it cannot bring about decision. It therefore helps the other arms in their appointed missions.<sup>12</sup>

However, his tone changed shortly after the First World War as his belief in the superiority of air power over other arms began to manifest itself in a belief that air power could win a war with little or no help from ground and naval forces. Mitchell began to preach that ground and naval forces were no longer viable because strategic air power could defeat an enemy without the need for invasion.

During the First World War, Mitchell planned to crush the German will to wage war by attacking cities with incendiaries and poison gas.<sup>13</sup> These attacks never

materialized, because the required bombers did not arrive in theater before the war came to an end. During the inter-war years, Mitchell continued to develop his theory that air power could defeat an enemy's will to fight by destroying his ability to resist. This could be done by destroying industry and population centers. He prophesied the destruction of industry, and mass evacuation of cities into the surrounding countryside. This panicked exodus to escape the apocryphal effects of air attack would overload existing food, water, shelter, and other infrastructure needs, causing further national dislocation. He predicted that surrender would shortly follow. Mitchell never specifically outlined what would finally force a country's leadership to submit. Douhet had suggested that an angry populous would refuse to support its government's effort to continue waging war, and demand that its leader surrender. Mitchell, apparently using a democratic nation such as the U.S., France, or England as a model, seemed to suggest that a government sympathetic to the plight of its citizens would feel compelled to surrender.<sup>14</sup> Like Douhet, Mitchell believed that air attack would cause the population to cease supporting the war effort as a result of self-preservation and fear. Without popular support or the physical means to sustain operations, the enemy's armed forces would be forced to capitulate.

### Warden

John A. Warden is a modern air power theorist who draws on past theorists, such as the ones discussed above, and historical examples from World War II through Desert Storm to formulate and support his ideas. Like Douhet, de Seversky, and Mitchell,

Warden stresses gaining air superiority as the first priority of an air force. Warden also stresses the dominance of air power over ground forces:

Since the German attack on Poland in 1939, no country has won a war in the face of enemy superiority, no major offensive has succeeded against an opponent who controlled the air, and no defense has sustained itself against an enemy who had air superiority, and attainment of air superiority consistently as been a prelude to military victory.<sup>15</sup>

Warden illustrates certain situations were one arm might be the key force supported by the others in deciding the outcome of a war. He also very clearly points out that war can be won from the air:

On some occasions, one arm will suffice, while at other times all three must be used in a wide combination of ways...Historically, then, single arms can prevail...<sup>16</sup>

Warden continues to describe how conditions that allow an air force to strike an enemy without fear of retaliation against its air bases can win a war alone.

Once an air force gains air superiority, Warden envisions an air force achieving victory by having the capability of striking vital targets deep in the enemy heartland. These targets correspond to various centers of gravity which Warden describes as the “Five Strategic Rings.” Starting with the center ring and moving outward, they are the enemy’s leadership, organic essentials, infrastructure, population, and fielded forces. Warden contends that whereas surface forces must start with “fielded forces” and work inward to “leadership” (Which he views as the most important or central “ring.”), air power can attack all five simultaneously.<sup>17</sup> More importantly, Warden differs from previous theorists in determining what to attack and why to attack it. Warden does not believe in attacking the will of the people by either attacking them or the infrastructure

that supports them. Nor does he see the purpose of air attacks being to collapse the fielded forces. Warden sees the enemy leadership as the most critical center of gravity. He stresses that the air campaign must focus on causing physical and psychological paralysis of the enemy's ability to effectively command and control the nation and the military. Once the enemy has been decapitated by destroying its leadership's ability to control the population and the military, effectively organize defense, or provide the logistics for waging war, he has no choice but to surrender. This surrender may be brought about by a hostile or unsupportive populace that demands that its government capitulate, or it may result from a rational government leadership that realizes it is no longer capable of conducting effective resistance. Moreover, Warden proposes that air power possesses the unique capability to accomplish this task alone.

#### Compare and Contrast

All four of the air power theorists discussed above have many similarities and some subtle differences. All four see the primary purpose of an air force as gaining air superiority first. All see air power as the superior arm over ground and naval forces and the primary defeat mechanism of an enemy's arsenal. All emphatically state that air power can win a war by itself.

Douhet, Mitchell, de Seversky, and Warden differ on what to target, why to attack these targets, and what will be the expected result. Douhet discussed attacking many targets: the people, air bases, industry, ground forces, etc.. However, the target he discussed in the most detail was the population. This is because he saw the purpose of air power as being to destroy the will of the people, and the best way he saw to do it was to

directly attack them. The expected result was that the people would rise against the government and force it to surrender.

Mitchell also discussed attacking a multitude of significant targets. The population, industry, infrastructure, raw materials and the military were pointed out as key targets. Like Douhet, Mitchell saw the people as the most vulnerable to air attack. By killing them from the air and destroying the food, water, electricity, housing, and sewage of the survivors, an air force could destroy the will of a nation without having to fight the army or navy. Like Douhet, Mitchell believed that once air power had won command of the air, its purpose was to defeat the nation's will to fight. Mitchell differed from Douhet in that he did not foresee the people of an enemy nation forcing their leadership to quit the fight. Although he did not totally discount such a thing from happening, he believed that a rational "democratic" government would realize the futility of subjecting its people to further privation and capitulate.

De Seversky believed that air power could defeat the enemy population's will to fight, but he did *not* advocate attacking the population directly. De Seversky proposed that air power should attack targets that allowed a nation to wage war and support the population. If these targets were effectively attacked, then the will of the people could be broken and surrender would follow.

Warden differs the most from the other theorists in that he does not see the will of the people as the key objective. Although the will of the enemy's people is a target worth addressing, he places a great deal of importance on the will of the enemy's leadership. Warden suggests that air campaigns should focus on attacking the will of the leadership.

He sees the leadership of an enemy nation as the brain of a system. By destroying the brain of the system, its other elements become weaker or difficult to control. Like de Seversky, Warden sees the folly of directly attacking a population. This is based on the historical failure of such actions along with the understanding that U.S. and world opinion would not look positively on a superpower deliberately bombing civilians. Attacking the fielded forces of an enemy is like hacking the limbs from an octopus, when air power provides the ability to attack the heart and brain of an enemy. By paralyzing the enemy leadership, the entire enemy “system” fails to function properly and must succumb to defeat.

All four of the theorists discussed in this monograph maintain that air power can win a war by itself because of its ability to directly attack the will of the enemy. By breaking the will of the enemy, air power can force a country to surrender. Although Douhet, Mitchell and de Seversky equate national will with the will of the people and Warden ties it with the will of the leadership, they all nonetheless believe that air power will win a war alone by breaking national will.

### Will

How to physically cause the enemy’s will to break through application of air power alone is the next part of the air power equation. Douhet and Mitchell talked of killing mass amounts of civilians in their homes and work places. De Seversky saw the folly of this in World War II, and suggested attacking industry, and infrastructure. In either case, life would be made uncomfortable for the populace while the ability to sustain war dwindled, forcing the population to demand capitulation or the government to

recognize futility in further hostilities and surrender. Warden believes in attacking certain targets that will paralyze the ability of the leadership to effectively prosecute the war, which leads to paralysis of the entire enemy “system” and eventual capitulation.

All four theorists seem to follow the same general thread of continuity in discussing what constitutes the breaking of enemy will through air power. Air power attacks a variety of key targets within an enemy country designed to cause internal dislocation through casualties, destruction of industry (the ability to resource war and produce a gross national product), communications, infrastructure (food, water, power, transportation, housing), and military forces. This dislocation can coerce the people or the leadership or both into abandoning the idea of continuing the war, leading to surrender. Therefore, the will of a people is theoretically broken by air power alone when targets linked to national will are successfully attacked. In spite of how intact an enemy’s surface forces are, his moral and physical ability to continue the fight are destroyed because he can no longer prevent further attacks from the air. The pain will only get worse. Theoretically, at the point that the enemy realizes this fact, his will to continue fighting is broken and surrender will follow.

### **III. The Hard Hand of Reality**

This chapter will look at many historical examples of the employment of air power at the strategic level starting with The Battle of Britain and ending with Desert Storm and NATO air operations over Bosnia. The purpose of this chapter is to apply the theories of Douhet, de Seversky, Mitchell, and Warden to real events and evaluate how much of their theories hold up to actual practice.

### The Battle of Britain

One of the most celebrated air campaigns in history is the Battle of Britain. Following Germany's rapid defeat of Poland and France in 1939 and 1940, the Wehrmacht began looking across the English Channel to its next victim. Although German army and naval planners disagreed on how to physically carry out the invasion of England, they all agreed that Germany must have air superiority in order to be successful.<sup>18</sup>

Goering proposed a plan that the Luftwaffe could destroy the air defenses of southern England in four days. The Luftwaffe would then spend four weeks bombing other targets in England that would allow the invasion force to serve more as an occupation force since England would be defeated from the air and unable to offer much resistance. Hitler approved the plan, and the Luftwaffe began to execute on 10 July 1940 with the intended invasion expected to take place around 23 September 1940.<sup>19</sup>

The plan as it was actually executed progressed in three phases. The first phase took place in July and early August, where the Luftwaffe attacked mostly shipping and naval targets. This had the dual purpose of serving as armed reconnaissance of the British air defense system (to include fighter tactics) and an attempt to lure a good portion of the Royal Air Force (RAF) into battle where it could be destroyed closer to German air bases on the continent. The second phase corresponded with the actual beginning of the *Battle of Britain* in mid August. It consisted of massive air attacks on radar stations, airfields, and air defense command and control. These attacks began with coastal regions in the south and southeast, and gradually worked inland. The purpose of this phase was

to destroy the British air defenses in southern England. The third phase began on 7 September 1940, when the Luftwaffe switched to bombing key cities with London as the primary target. This final phase ended on 12 October 1940, when Hitler decided to postpone the invasion of England until spring of the following year.<sup>20</sup> Although the German bombing of England continued throughout the winter of 1940-1941, it was considerably less intense and eventually tapered off to a more manageable level as the German Army and Luftwaffe turned their attention east to invade the Soviet Union.

Goering's Luftwaffe failed to produce the promised victory over England from the air. After nearly three months of massive air assaults against England, the Luftwaffe had destroyed 915 British aircraft, and had lost 1,733 of its own. Over 13,000 British civilians were killed, and more than 20,000 severely injured in London, Manchester, Birmingham, and Liverpool.<sup>21</sup> English will to fight had not been broken by destroying industry, infrastructure, homes, and killing of civilians. In fact, British resolve increased as a result of German bombing.

There were many factors that contributed to the Luftwaffe's failure to defeat England from the air. There were some technological advantages enjoyed by England in the form of radar. The RAF also had a well planned and integrated air defense system that provided critical intelligence and effective, coordinated command and control of fighter assets, balloons, and air defense artillery. The quality of British aircraft and pilots was equal to that of the Germans, which was also a new problem the Luftwaffe had not yet faced. The factors most relevant in answering the research question lie with the physical aspects of the battlefield, doctrine, and the German campaign plan itself.

The design of German aircraft, and the doctrine for employing the Luftwaffe were closely tied to the tactical support of German ground forces in combined arms warfare. The Luftwaffe had not envisioned itself being employed as a strategic arm in the 1930's when it was developing its own doctrine. The short range of German fighters and small payload of their bombers were not debilitating factors when supporting armored breakthroughs, but caused severe handicaps when attempting a campaign of attrition against a well defended distant enemy. Goering believed the rapid successes in Poland and France were due to the superiority of the Luftwaffe over the Wehrmacht.<sup>22</sup> What he did not realize, was that the Luftwaffe and panzers were complementary components of a superior tactical system. The Luftwaffe assisted the army by helping to set conditions for armored penetrations and exploitation of enemy defenses. The rapidly advancing armored formations captured enemy airfields, which had the dual effect of pushing enemy air coverage farther back while providing forward bases for the Luftwaffe. This synergistic effect created an irresistible tactical momentum, enabling the rapid defeat of Poland, Norway, and France. The opposing air forces of Poland, Norway, and France were hardly *peer opponents*. In the Battle of Britain, the Luftwaffe faced a better armed and more determined foe in the RAF, and the German Army was not there to complement and exploit gains made from the air. What resulted was a battle of attrition in the skies over England that was not entirely unlike the trench warfare of 1914 - 1918.

Part of this battle of attrition gave England the advantage in losses. German pilots who survived getting shot down over England were lost forever as prisoners of war. Their British counterparts were often able to return to their squadrons and take to the sky

in a new airplane that same day. However, the second phase of the German campaign placed such a severe strain on planes and pilots that RAF records show that the Luftwaffe may have been on to something.<sup>23</sup> Aircraft production in England was not able to keep up with losses. Additionally the replacement of pilots was not able to keep pace with casualties, and the pilots who did replace losses were considerably less trained than the men they replaced.<sup>24</sup> Also, the targets of the Luftwaffe were dispersed over the whole south and east of England, which spread out the RAF fighter squadrons and anti-aircraft guns. This dispersal of German targets and subsequent dispersal of British defensive assets made it difficult to protect everything with any kind of mass. The German strategic blunder of targeting London took the strain off RAF command and control, bases and aircraft production. The Germans believed the RAF would rise up in mass numbers to defend London. By forcing the British to commit the majority of their airplanes in defense of London, the Luftwaffe hoped to engage them in a series of climatic air battles and destroy the RAF. However, the RAF knew what the German bombers were attacking every time they attacked, and there were only a few routes in and out that supported the limited range of the German bombers and fighters. Armed with such knowledge, the RAF was able to mass in greater numbers to defend than previous German attacks. The RAF caught Luftwaffe fighters on their way home after they had reached the limit of their fuel endurance, and were unable to expend precious fuel to maneuver in air combat. German bombers suffered a similar fate as they doggedly attempted to continue on to their intended targets and return home without effective fighter protection.

The Germans never established air superiority over England and their air campaign failed to break the will of the English people. The tactical nature of Luftwaffe aircraft seems to have been the undoing of the Luftwaffe in the Battle of Britain. Germany developed a predominantly tactical weapon in its Luftwaffe, and attempted to use the tactically oriented Luftwaffe as a strategic instrument of military power. However, it was tactical air power that helped to give the Nazis their victories over Poland, Norway, and France. The phase two targets of the Luftwaffe corresponded more closely with campaign targets suggested by de Seversky and Warden, and showed promise of some degree of success. The switch to London as the target in phase three corresponds with targets suggested by Douhet and Mitchell, and proved to be a failure.

#### The Air War Over Germany

The air war over Germany began in December 1939 when the first British bombers dropped seven tons of bombs on Germany that month, and ended in May 1945 after the combined U.S. Army Air Force (USAAF) and RAF Bomber Command had dropped 2,770,540 tons of bombs on the German war machine.<sup>25</sup>

England carried the burden of the air war alone from 1939 until August 1942 when the first USAAF bombers began to participate. The British quickly learned the same lessons that the Germans had learned about daylight bombing with little or no escort, and resorted to bombing at night by the Fall of 1940.<sup>26</sup> Since the technology did not exist to permit the RAF to conduct *precision bombing* of specific targets of military value, they had to conduct *area bombing*. Area bombing called for mass raids of airplanes that dropped large amounts of bombs over an area with the intent of damaging

the intended target. This had the obvious side effect of destroying more civilian targets and killing more civilians than military targets and personnel, but had the potential for cracking the will of the German citizens. In order to expect some degree of success in damaging the military target, these night raids had to lay waste to large areas of urban residential areas. The British would continue with night area bombing missions throughout the war, attempting to be more precise in late 1944 when U.S. technological advances in sighting at night became more available.<sup>27</sup>

The USAAF ignored RAF advice to bomb only at night and insisted on executing daylight precision bombing to obtain a greater degree of accuracy while limiting collateral civilian casualties. Although this technique was relatively more accurate and caused relatively less casualties than area bombing, the USAAF still accounted for large areas of urban residential destruction. The U.S. concept was based on its use of the Norden bombsight, which promised a predictable level of accuracy from high altitude. U.S. losses were initially prohibitively heavy as the USAAF attempted to attack targets deep in German territory without the benefit of fighter cover. These losses forced the USAAF to adopt a policy of bombing only within fighter range.<sup>28</sup> The fighters were restricted to a tight defensive tether to defend the bombers, and were initially forbidden to stray off after German fighters in order to conserve fuel. Once the USAAF began fielding long range fighters and external fuel tanks that enabled fighters to escort bombers deep into Germany *and* give chase to Luftwaffe fighters, the USAAF policy changed to encourage fighters to engage German fighters whenever they could be found. The onslaught began in February 1944. German fighter losses rose sharply, and by

6 June 1944 they were unable to mount much resistance to the bombers or threaten the invasion beaches.<sup>29</sup>

Once the USAAF entered the strategic air war in 1942, the RAF and the USAAF developed a plan to coordinate their efforts that was known as the Combined Bomber Offensive. It was assigned the official code name POINTBLANK.<sup>30</sup> This plan guided RAF and USAAF air operations until the end of the war. It listed a number of targets in priority and the purpose for destroying them. The plan was jointly agreed upon by the RAF and the USAAF, and contained six systems comprising seventy-six specific targets to attack. These systems were:

- German Aircraft Industry
- Submarine construction yards and bases
- Ball bearings
- Oil
- Synthetic rubber and tires
- Military transport vehicles<sup>31</sup>

The plan was incorporated into the Casablanca Directive and published on 18 May 1943 with this stated mission and intent:

To conduct a joint United States-British air offensive to accomplish the progressive destruction and dislocation of the German military, industrial, and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened. This is construed as meaning so weakened as to permit initiation of final combined operations on the continent.<sup>32</sup>

The two greatest results of this plan were the destruction of the Luftwaffe, and the reduction of the German oil capability. The Luftwaffe was not destroyed by bombing, but rather through air combat as it rose on repeated defensive missions against allied bombing only to be shot down by long range fighters. Records from *The United States*

*Strategic Bombing Survey* and the United Kingdom's official history of the Allied air offensive on Germany show that the attack on oil production had the greatest direct bombing effect.<sup>33</sup> The German war machine was always tight on fuel, and the concentrated attack on this industry caused critical shortages. Additionally, petroleum byproducts that the war machine needed such as nitrates for agriculture fertilizer, methanol for explosives, and synthetic rubber production were also affected by the attacks on oil production.<sup>34</sup>

By the time Germany surrendered, every major city in Germany was devastated. 300,000 civilians were killed, 780,000 were injured, and some 7.5 million were homeless.<sup>35</sup> However, most postwar studies show that German armaments production continued to rise, and efforts to knock Germany out of the war from the air by bombing specific industrial targets ultimately proved to be failures.<sup>36</sup> Several sources used for this monograph (Winston Churchill's memoirs being one of them) state that the Allies did not overestimate the destructive capability of strategic bombing, but seriously underestimated the resiliency of German industry and people. The Allied strategic planners had assumed that German industry was already at a strained wartime pitch when the war began. However, hindsight shows that German industry was running at a fraction of its full wartime capacity when hostilities began, allowing for resiliency and growth under the able Albert Speer. Winston Churchill had this to say about this error in intelligence:

We certainly underestimated the strong latent reserve in Germany's industry and the great reserves she had gained from Occupied Europe. Thanks to well-organized relief measures, strict police action, and innate discipline and courage, the German people endured more than we had thought possible.<sup>37</sup>

This comment on the will of the German people from Gordon Wright in *The Ordeal of Total War* also illustrates a failure to learn from the English experience in the Battle of Britain:

No doubt the British, after their own experience with the civilian response to mass bombing in 1940-1941, ought to have anticipated the effect on Germans as well. They were mislead that German morale, for some reason was more vulnerable than that of Englishmen.<sup>38</sup>

Albert Speer, when interviewed after the war, did credit the Americans with being more effective on disrupting German industry with precision bombing than the British with their area bombing campaign.<sup>39</sup> The strategic air war certainly hampered the German war effort. It diverted, depleted, and destroyed resources, that could have otherwise helped Germany maintain the initiative. However, it is key that the air war failed to destroy the will of the people to endure and support.

The strategic air offensive against Germany certainly contributed to the defeat of Germany by disrupting its civilian and military activity, and causing a strain on public morale, industry, and transportation. According to many studies and historical references, its greatest contribution was the destruction of the Luftwaffe, the crippling of German oil production, and its tactical support of allied ground forces. However, the air offensive fell far short of its expected objectives in the war against Germany. *The United States Strategic Bombing Survey* does not subscribe to this point of view, but other key resources such as the official UK history of the air war, and Churchill's memoirs take a more objective approach to the issue.<sup>40</sup> The concluding survey of *The Strategic Air Offensive Against Germany 1939-1940* has this to say about the effect of the Allied strategic air effort:

German war production increased and increased again, ...the German people remained loyal and obedient, and the German armed forces continued to fight with great bravery and with no less efficiency than before.... Nor could have either of these two commands (RAF Bomber Command and the USAAF) done what they did if the armies had not made the successful invasion of June 1944, which brought them in so short a space of time to the German frontier, or if the sea lanes between Europe and America had not been kept open throughout the Battle of the Atlantic. On the other hand, the victory in the Battle of the Atlantic owed something to the assistance given by the strategic air forces, and without the even greater assistance which they gave the armies, the invasion could have hardly been attempted at all.<sup>41</sup>

The Allied air planners followed a combination of Douhet, de Seversky, and Mitchell in targeting industrial, military, and civilian targets in an attempt to dislocate the German command and control, ruin its economy, destroy its war production, and break the will of the people. Allied air power succeeded in destroying the Luftwaffe and gaining command of the air. It also severely crippled Germany's oil production,<sup>42</sup> which had severe ramifications on a modern mechanized army and air force. However, Allied air power fell far short of the theoretical anticipations expected of it by the Allied air planners at the outset of the war and predicted by air power theorists years before. With all the massive destruction delivered, as promised, the enemy still possessed the means to fight until an army had defeated him in the field. The will of the people had not broken. They did not quit supporting the government and demand that it surrender. When the Army finally surrendered, the people acquiesced:

In Europe a land war was fought, supported logistically by sea, in which the fighter and tactical bomber airplane were decisive factors. The European war was won only when the enemy's land armies, which supported his political structure, were pursued and defeated and his political structure then collapsed. That is the classic aim and the classic result of land warfare.<sup>43</sup>

Air power did not win the war with Germany in the Second World War alone, nor did its contribution outweigh that of ground or naval power. Germany was defeated by the *combined* effects of air, ground, and naval power. The synergistic effect of these three arms working in concert with each other defeated the Nazi war machine.

#### The Air War With Japan

Until 1944, Allied strategic air power was limited to attacking tactical or strategic targets on the Asian mainland, or supporting the ground fighting in the islands of the Pacific. By April 1944, the USAAF had established the 20th Air Force in China with air bases and long range bombers. The sole mission of the 20th Air Force was to bomb the Japanese islands with the purpose of destroying war production facilities and breaking Japanese will. The 20th Air Force prepared for its mission by bombing targets in China and Manchuria, and on 14 June 1944 conducted its first raid on Japan.

The 20th Air Force was never very successful in seriously damaging Japan's industry or defeating the will of the Japanese people. It was hampered by severe logistical constraints because all resupply, including fuel and repair parts, had to be flown "over the Hump" from India.<sup>44</sup> Its attempts to make a strategic dent by attacking strategic targets on the mainland were mainly nullified by the fact that Allied sea power had destroyed the capability of the Japanese to ship much of its resources from the mainland to Japan.<sup>45</sup> Additionally, the Japanese military industrial complex relied in part on an active cottage industry. The dispersed nature of cottage industry made a difficult strategic bombing target. U.S. air planners would face a similar problem in Korea and Vietnam. By December 1944 the 20th Air Force was moved to the Southwest Pacific

theater to support ground operations there, because USAAF bombers had been positioned in Guam, Saipan, and Tinian in late 1944 and were beginning to meet with some success.

Strategic bombing of Japan did not begin to gain momentum until late 1944. The first of many very successful raids did not occur until 9 March 1945 after the U.S. decision to use incendiaries to take advantage of the mainly wood construction of Japanese buildings. A second critical change was to bomb from low altitude at night as opposed to high altitude in daylight. In this raid, Tokyo lost eighteen percent of its industrial area, 83,000 killed, and 41,000 injured.<sup>46</sup> In the few months remaining in the war, the USAAF bombed the major Japanese cities of Tokyo, Nagoya, Kobe, Osaka, Yokohama, and Kawasaki with similar results. Over forty percent of the urban areas of these cities was destroyed.

By June 1945, the U.S. had decided to invade Japan in November 1945. This was determined after Army, Navy, and USAAF leaders debated whether they should invade or conduct an aerial and naval blockade of the Islands. The final decision not to force decision from the air was based on the failure of the strategic air war in Europe. The general feeling among the ground and naval commanders was that air power had failed to deliver what it promised in Europe at an extremely high cost in men and material, and would be unable to deliver on the same promise in the Pacific.<sup>47</sup>

At this point, it is necessary to understand the state of mind and affairs of the Japanese leadership leading up to August 1945 when the atomic bombs were unleashed. By April 1945, Japan had suffered serious military defeat in the Phillipines, Okinawa (a Japanese island) had been invaded, and the Soviet Union had notified the government

that it would not renew its four year old neutrality pact with Japan. The Allies were on the offensive in the Pacific and on the mainland. The Japanese Navy was a shell of itself, and its maritime commerce had all but halted. The civilian leadership and, most importantly, the Emperor realized that Japan was militarily defeated and desired to end the war as soon as possible in order to obtain a favorable settlement. Further fighting would only make the end worse for Japan. On June 22, 1945 the Emperor called a meeting of all civilian and military leaders to urge them to end the war by diplomatic means.<sup>48</sup> The Japanese attempted to persuade the Soviet Union to mediate on their behalf, but Stalin rebuffed them. The major stumbling block to Japanese capitulation was the Potsdam Declaration's proclamation of unconditional surrender. The root of this concern was a guarantee of the security of the institution of the Emperor.<sup>49</sup> Although the Emperor and the civilian leadership favored an immediate diplomatic end to the war, the majority of the military leadership urged for a costly military defeat or attrition of an Allied invasion force to secure a favorable diplomatic end to the war. The internal Japanese politics over how to bring about an end to the war continued until 6 August 1945.

On 6 August 1945, two events rocked the Japanese leadership to the core. The first was the detonation of an atomic bomb over Hiroshima that destroyed the city and killed over 100,000 people.<sup>50</sup> The second event was equally distressing. The Soviet Army attacked the Japanese in Manchuria with all the fury of mechanized warfare learned from five years of fighting with Germany. By 8 August, the Japanese leadership was hotly debating the issue of surrender when the second atomic bomb was dropped on

Nagasaki with a loss of 35,000 more souls.<sup>51</sup> The military would still not concede to unconditional surrender until the Emperor again demanded Japan accept surrender. The Japanese finally surrendered on 14 August amid a failed coup by fanatical Army officers who wanted to continue to resist. The official surrender did not take place until 2 September 1945 in Tokyo Bay aboard the USS Missouri. The atomic bomb strikes against Japan did not end the war in the Pacific. Although Japanese capitulation was only a matter of time, Japanese military die-hards wanted to continue the war in order to cause the Allies to settle on favorable terms due to war weariness. In fact, some key military leaders were convinced that the U.S. did not possess the ability to produce more atomic bombs. What the atom bombs did accomplish was to force the Emperor to intercede and force the country's leadership to accept the Allied terms of surrender. This comment from General Curtis LeMay after the war best illustrates this point:

It is true that the war was over before the atomic bomb was dropped. We know that because we had broken their code; we knew that the Japanese had approached the Russians and asked them to negotiate an end to the war...The war would have been over in time without dropping the atomic bombs, but every day it went on we were suffering casualties, the Japanese were suffering casualties, and the war bill was going up.<sup>52</sup>

Air power did not win the war against Japan alone. Nor did it, as in Europe, deliver the promised results. *The United States Strategic Bombing Survey* again points out the obvious destructive power of strategic bombing. However, air power had not achieved the theoretical decision prophesied by theorists and USAAF air power advocates. The faith in air power to achieve grand results in the Pacific had been lost by the inability of air power to produce the same results in Europe. Strategic air power in the Pacific had not been instrumental in destroying Japanese air power. Japanese air

power had been defeated by a combination of tactical air battles (both carrier and land based) and the loss of air bases to ground troops. Japanese industry had been crippled to war losing levels by naval interdiction of raw materials flowing to Japan before the USAAF was able to seriously attack industry from the air. As in Europe, the will of the people had not been broken by air attack. The people continued to support the government and did not force the leadership to accept surrender. The leadership did not, as Warden contends, capitulate because it could no longer defend the country from devastation by air attack. Japan was equally unable to prevent naval forces from operating in Japanese waters or ground forces from landing on any of the home islands at any time. Japan was *militarily* defeated by the *military* of the United States. Air attack certainly was a *factor* in Japanese surrender, but it was not the primary reason:

In the Pacific a naval war was fought, in which aircraft were fleet weapons and in which ground forces were decisive by virtue of seizing the land bases without which neither the fleet nor land-based aircraft could have operated. That war was won, with a major portion of the enemy's land army intact, when his seaborne lifeline had been destroyed and slow strangulation had set in. And that, in turn, is the classic aim and the classic result of sea warfare.<sup>53</sup>

Japan's once mighty Combined Fleet was destroyed, and the islands were under naval blockade. Japanese air power had been defeated. The U.S. was poised to land an invasion force of several hundred thousand soldiers and Marines on the main Japanese islands. The Soviet Union had attacked and destroyed the Japanese Army in Manchuria, adding one more country stacked against the Japanese. The Japanese Army in the Pacific and on the mainland had been defeated or was unable to effectively resist. The Emperor and most of the rational members of the Japanese civilian and military leadership recognized this, and attempted to gain a negotiated end to the war as early as April 1945.

Japan had suffered a complete military defeat through ground, naval and air operations.

Air operations alone did not and could not have accomplished this.

### Korea

The Korean War was the first major conflict to occur involving major powers since the end of the Second World War. It was the first major conflict of the Cold War that saw major powers from both sides directly involved, and it was executed under the shadow of possible nuclear weapons use. The Korean War began on 25 June 1950 when the North Korean People's Army (NKPA) invaded South Korea. The war ended with an armistice on 27 July 1953, with a U.S. cost of 54,246 killed, and 103,284 wounded.<sup>54</sup>

The newly created United States Air Force (USAF) established air superiority over the small and outdated North Korean Peoples' Air Force (NKPAF) within a month, and maintained this superiority throughout the war even after modern MiG jet fighters piloted by Chinese and Soviet *volunteers* entered the fray. Once the USAF had accomplished this key task, it was faced with something Air Force doctrine had not foreseen. North Korea did not present the slightest fraction of strategic targets that the U.S. had attacked during World War II. Air Force doctrine had evolved around the concept of total war that included atomic weapons. The Air Force had envisioned a peer opponent with a heavily industrialized rear that supported a large mechanized army and modern air and naval forces. North Korea was an agrarian society that depended on exports of tanks, aircraft, and other trappings of modern war from friendly Communist countries. Nothing in Korea lent itself to attack by mass formations of strategic bombers. This comment from a young Air Force bomber pilot in 1950 explains the position the USAF found itself in:

They were trying to find some targets in Korea that were big enough for us to hit. They simply had not crystallized how to fight this type of war, when we had aircraft designed for large scale formation operations.<sup>55</sup>

Consequently, the overwhelming majority of sorties eventually flown by the USAF in Korea were in tactical support of ground units.<sup>56</sup> It is here that U.S. air power had the most devastating effect on the Communist forces. Unfortunately, the USAF had not devoted much thought to supporting ground forces after World War II. There was much confusion and frustration in the form of missed targets and fratricide until much later in the war. This comment from a British RAF pilot who was present with the UN forces:

“There was a lack of cooperation between the Air Force and the Army at all levels.”<sup>57</sup> Still wanting to prove that theories about the superiority of air power over other forces were right, the USAF flew thousands of sorties in pursuit of this goal that had little or no effect. The NKPA and Chinese Communist Forces (CCF) continued to be resupplied, and continued to receive reinforcements. These armies were infantry based, required very little logistical tail, and presented poor strategic or interdiction targets for the USAF. By 1952, every major city and industrial target in North Korea had been flattened, and hundreds of thousands of civilians were killed, yet the will of the North Koreans and Chinese never collapsed:

The lessons of the Korean War for air power seemed self-evident to the ground force commanders, and to those politicians who took the trouble to inform themselves about such things. The experience of World War II showed that intensive strategic bombing could kill large numbers of civilians without decisive impact on the battlefield, or even on the warmaking capacity of an industrial power. Bombing could inflict a catastrophe on society without defeating it.<sup>58</sup>

Despite the intense efforts of the USAF in Korea, the communist armies were able to launch a total of six offensives during the war. The greatest effect of U.S. air power was felt at the tactical level where U.S. air power helped ground forces defeat Communist attacks and supported UN offensives with devastating and uncontested effect. The interdiction of Communist LOCs did force them to conduct all movements at night to reduce the risk of UN air attack. However, the Communist forces continued to receive enough supplies and reinforcements to enable six offensives against the UN in three years. De Seversky had discussed the potential problems presented by waging an air war against an underdeveloped country:

Total war from the air against an undeveloped country or region is well nigh futile; it is one of the curious features of the most modern weapon that it is especially effective against the most modern types of civilization.<sup>59</sup>

Although experience quickly pointed out that air power was most effective in its tactical role in Korea, the USAF continued to try and force the issue of winning the conflict from the air at a strategic level. This proved to be impossible, yet air power disciples could not admit it for fear of being subordinated to the Army as an instrument of support. Air power true believers had to overstate the importance of the contribution of air power in the Korean War, just as they had done after the Second World War:

Without question, the decisive force in the Korean war was air power.<sup>60</sup>

Air power disciples again claimed that the air arms of the U.S. military had validated the theory of air power as *the* decisive weapon on the battlefield, and would maintain this belief as the U.S. entered similar circumstances in Vietnam a decade later. Failing to

learn valuable lessons about air power employment in *limited* wars like Korea would come back to haunt air planners from 1965 through 1972:

It is not surprising that that the airman's limitless faith in what they could achieve remained undiminished after Korea, as it had after World War II. If they admitted some of the bitter truths revealed by those wars, a critical part of the U.S.A.F. rationale for its own independent operations would cease to exist. But it remains astonishing that ten years later in Vietnam, they were allowed to mount a campaign under almost identical circumstances to those of Korea, with identical promises of potential and delusions of achievement, and exactly repeated lack of success.<sup>61</sup>

Air power in the Korean War had two decisive impacts on the conflict. It secured air superiority throughout the war, and provided a devastating combined arms effect on enemy ground forces when employed in conjunction with UN ground forces. It failed in its strategic role. Air power did not destroy the will of the North Korean and Chinese people or their militaries, nor did it prevent the Communists from physically being able to wage war. Air power alone did not bring about a negotiated end to the war.

#### Vietnam

The U.S. air war in Vietnam began in early 1965 and ended in early 1973. Four major air campaigns were conducted during this time in an attempt to force North Vietnam to its knees and win the war. The first campaign, code-named Flaming Dart, took place in February 1965 as a series of retaliatory raids for the communist attack on Pleiku. The second campaign lasted from March 1965 through November 1968. This campaign was code-named Rolling Thunder. The third campaign, called Linebacker I, lasted from 9 May to 23 October 1972. The fourth and final campaign was referred to as Linebacker II, and was executed over eleven days in December 1972. Flaming Dart and

Rolling Thunder took place during the Johnson administration, and the Linebacker campaigns took place during the Nixon administration.

Flaming Dart was largely a retaliatory attack that targeted the means for the North Vietnamese to attack Pleiku. Its effects were nominal, and not intended to have strategic ramifications. Rolling Thunder was originally intended to last eight weeks, but President Johnson ordered it continued until November 1968. Rolling Thunder began as a series of raids to demonstrate to the North Vietnamese leadership what was possible if it did not reverse its policy towards South Vietnam, and gradually developed into a continuous strategic campaign. The purpose of the continuous campaign was to gradually increase the level and intensity of bombing until the North stopped supporting the Viet Cong. The USAF believed it could destroy the morale of the Viet Cong and North Vietnam and cause them to lose the will to fight. As in other wars before, the air planners had not overestimated the destructive capacity of air power, but vastly overestimated its effects. Three times the amount of bombs dropped on Germany in World War II were dropped on an area roughly the size of Texas.<sup>62</sup> The bombing also took place in South Vietnam against Viet Cong and NVA held areas, causing over one quarter of its rural population to flee to larger cities.<sup>63</sup> Tens of thousands of Vietnamese were killed, injured, or rendered homeless. The U.S lost over 900 aircraft during the campaign.<sup>64</sup> Yet by 1968, the Vietnamese had not lost their will or the ability to sustain Viet Cong and NVA forces in South Vietnam. Secretary of Defense Robert McNamara was already seeing the writing on the wall as early as 1966:

Enemy operations in the South cannot, on the basis of the reports I have seen, be stopped by air bombardment-short, that is, of the virtual annihilation of North Vietnam and its people...No amount of bombing can end the war.<sup>65</sup>

McNamara's bleak analysis was confirmed by a study done for the Institute of Defense Analyses that declared that the bombing campaign was having no measurable effect because the North Vietnamese society was basically agrarian, which did not offer a suitable strategic air target. It also concluded that the small amounts of supplies needed to sustain communist forces in the South could not be interdicted due to the primitive nature of the communist logistical system. The Vietnamese proved to be no less stalwart than the British, German, Japanese, or Korean people who had weathered the storm of air power in previous wars with their will intact. This comment came from a North Vietnamese civilian in Stanley Karnow's *Vietnam*:

There was extraordinary fervor then. The Americans thought that the more bombs they dropped, the quicker we would fall on our knees and surrender. But the bombs heightened rather dampened our spirit.<sup>66</sup>

North Vietnam demonstrated the complete failure of Rolling Thunder by mounting the Tet Offensive in 1968 - the very thing Rolling Thunder was supposed to prevent. Despite the best efforts of the USAF to interdict and discourage, the North Vietnamese had managed to infiltrate enough equipment and personnel into the South to mount an offensive that covered the entire length of the country. This was not the act of a country that had lost the will or the means to continue the fight. As in Korea, U.S. air power made its greatest contribution in the tactical realm by inflicting heavy losses on Communist forces in contact with U.S. ground forces. B-52 bombers were used for the first time in a tactical air support role. The greatest strategic contribution was the establishment of air superiority. Although Johnson initially forbade attacks on North Vietnamese airfields until 1967, U.S. superiority in the air was never seriously

challenged.<sup>67</sup> The tactical effectiveness of U.S. air power forced the Vietnamese to adopt three asymmetrical countermeasures besides building a massive air defense. They conducted raids on U.S. air bases in South Vietnam with Viet Cong. The communists also put everything of significance under ground in tunnels and caves. Finally, they adopted the tactic of *hugging the belt*, by engaging U.S. ground units so closely that the use of air or artillery was often done with some considerable danger to the supported unit.

Linebacker I had the initial purpose of crippling the ability of North Vietnam to sustain offensive operations in the South. By September, the intent had switched to compelling the Hanoi leadership to sign a peace agreement by October. Linebacker I was a tactical success because it did blunt the offensive capability of North Vietnam,<sup>68</sup> but it failed to force the North Vietnamese leadership to agree to Nixon's peace proposal. The amount of destruction inflicted on North Vietnam was considerable, because technology allowed the U.S to make use of large amounts of precision guided munitions (PGMs) to attack targets with significantly reduced possibilities of collateral damage to civilians. The advent of increased PGM use also permitted U.S. aircraft to strike targets from distances outside the range of most NVA air defense systems. Additionally, unlike Rolling Thunder, the majority of the sorties flown into North Vietnam were Surface to Air Missile (SAM) suppression missions rather than strike missions. Although the campaign was a tactical success because it assisted the Army of the Republic of Vietnam (ARVN) in defeating the NVA offensive (usually referred to as the Easter Offensive), it did not force Hanoi to agree to all the peace proposals offered by the U.S. and Saigon. The negotiators from Hanoi walked out of the peace talks.

Linebacker II was an attempt to force the Hanoi government to sign a peace treaty by bombing everything of conceivable value over an eleven day period. It was aimed at the will of the North Vietnamese leadership. It was also designed to demonstrate to President Thieu the ability of the U.S. to destroy the NVA's ability to mount offensives into South Vietnam. The attacks had no immediate operational impact on the Communist forces in the South. The campaign did effectively destroy the air defense system around Hanoi and other key targets such as airfields. This was because the Vietnamese fired nearly all the Surface-to-Air Missiles (SAM) in its inventory, while the Air Force destroyed many sites and the only SAM assembly factory in Hanoi. The flow of supplies over mountain passes into North Vietnam from China was also slowed by the use of laser-guided bombs (LGB) to destroy tunnels and block narrow defiles. U.S. air losses were initially heavy (over 6%) due to the advanced capability of the North Vietnamese air defense system, which was ranked third in the world after the Soviet Union and Israel.<sup>69</sup> Linebacker II, also known as The Christmas Bombing, received much world wide public condemnation because B-52s were used against Hanoi and Haiphong for the first time in the war. The destruction wreaked in the cities by them was considerable, and the psychological effect on the people enormous. Although the loss of civilian life was relatively slight (1,318 killed, 1,216 wounded in Hanoi with 305 killed in Haiphong),<sup>70</sup> it did not prevent the Pope from speaking out against the U.S.:

Pope John Paul VI told an audience at the Vatican that the bombing of "blessed" Vietnam was causing him "daily grief."<sup>71</sup>

Linebacker II had not ended the war. Its major contribution was to force the Hanoi negotiators back to the peace talks within a month after they had walked out. The

North Vietnamese were ready to agree to the peace proposal of October, but the South Vietnamese were being obstinate. They would not agree with Secretary of State Kissinger's proposal that the 100,000 NVA regulars in the South could remain. The South was convinced to agree to the treaty by two events. Nixon promised to continue U.S. aid to the Thieu government, but he warned Thieu that the U.S. was going to get out with or without Saigon's help:

I have ... irrevocably decided to proceed to initial the Agreement on January 23, 1973 and to sign it on January 27, 1973 in Paris. I will do so, if necessary, alone. In that case I shall have to explain publicly that your Government obstructs peace. The result will be an inevitable and immediate termination of U.S. military and economic assistance which cannot be forestalled by a change of personnel in your government.<sup>72</sup>

The second major event was that the U.S. Congress voted to end all funding for U.S. involvement in Southeast Asia. Finally, Hanoi's relations with China were severely strained, and the Soviet Union had a strong desire for the conflict to end. The successful diplomatic efforts of the Nixon administration were *the* key reasons for ending U.S. involvement in the war. The military actions of Line Backer II were key in coercing the North Vietnamese to return to the negotiations in Paris. The relatively unrestrained application of air power over North Vietnam in Linebacker II threatened to severely reduce North Vietnam's offensive capability. Faced with such a prospect, the alternative of reopening negotiations with the U.S. presented a better alternative to continued obstinance. However, the diplomatic initiatives offered by Kissinger at Paris were agreeable to the North Vietnamese. American air power was key in that it hastened the North Vietnamese to sign the Paris accords at a period when the North Vietnamese believed time was on their side. The application of air power alone did not induce the

North Vietnamese to sign the Paris accords. Tactical air power in Vietnam was a decisive factor, and strategic air power had failed to deliver promised results until Linebacker II. However, air power disciples hold up Linebacker II as evidence that strategic air power won the war in Vietnam, without taking into account other more decisive factors:

As long as air power enthusiasts cling to Linebacker Two as evidence to support the hallowed doctrine of strategic bombing,<sup>73</sup> what history can teach them about Vietnam and air power will go unlearned.

The U.S. withdrew from Vietnam in 1973, and it had failed to achieve its strategic objectives in Southeast Asia. The U.S. had no coherent strategy for Vietnam, and failed to win the war on the ground. The greatest contribution of air power in Vietnam was the establishment of air superiority, and the tactical support of ground units. It did not bring about the end of U.S. involvement by itself. Nor is there any real evidence to support the claim that unrestrained bombing from the start, like World War II, would have contributed anything more. The war had to be won on the ground, and could not be won from the air. The air planners and advocates failed to recognize the most effective role for air power in Vietnam and effectively apply it. Instead, they insisted that strategic attack from the air had secured the Paris Peace Accords of 1973:

The most popular and most widely accepted Vietnam myth is that Linebacker Two “won” the war. A corollary to the myth holds that if air power had been used with equal resolve earlier, anytime between 1965 and 1969, the war could have concluded sooner and on more favorable terms. This line of reasoning has contributed to an our-hands-were-tied-behind-our-back thesis that held sway in the German officer corps after World War I. The our-hands-were-tied thesis has dominated thinking about Vietnam in the Air Force because it blames the final outcome on a pernicious press, the antics of antiwar activists such as Jane Fonda, and, perhaps most disturbingly, on “interference” by politicians who restrained the military.<sup>74</sup>

### Desert Storm

The most recent war that has seen massed U.S. ground, air, and naval forces employed against an enemy was in the Persian Gulf. This was brought about by the invasion of Kuwait by Iraq on 2 August 1990. The U.S. deployed ground, air, and naval units to the region to initially defend against further Iraqi aggression in the region under the code name Desert Shield. The U.S. and its coalition allies then transitioned to the offensive to force Iraq out of Kuwait and restore the legitimate government of Kuwait under the code name Desert Storm. Desert Storm began on 17 January 1991 with an air offensive against Iraq and its forces in Kuwait, and ended with a cease fire under terms dictated by the coalition on 28 February 1991.

The air war over Iraq and Kuwait was precipitated by some negative press for the air power advocates. On September 16, 1990, The *Washington Post* front page had the headline “U.S. to Rely on Air Strikes If War Erupts.”<sup>75</sup> The Air Force Chief of Staff, General Michael Dugan had apparently given an interview expressing the opinion that air power could win the war alone, or at least play *the* dominant role. This act by one of the service chiefs was unforgivable to General Colin Powell, the Chairman of the Joint Chiefs of Staff, and to Dick Cheney, the Secretary of Defense. Both men had discussed with President Bush joint service operations employing combined arms to provide victory for any conflict the U.S. might fight:

If the conflict with Iraq ever turned violent, Powell and Cheney said, every service would have to play a part. The idea that air power alone could achieve victory, as Dugan had suggested, was a dangerous and foolish idea.<sup>76</sup>

General Dugan was immediately relieved of his position by the Secretary of Defense.

In the early days of Desert Shield, the Central Command (CENTCOM) commander, General Schwarzkopf, asked the Air Staff for some help in formulating the CENTCOM theater air campaign plan. The Air staff dispatched Colonel John Warden to brief the CENTCOM commander on an air campaign plan he called *Instant Thunder*. Instant Thunder embodied the principles of Warden's theory on the employment of air power. Warden's plan also hinted at his central theoretical argument that air power was supreme, and could win wars on its own:

The plan progressed through a number of versions during the ten days Warden briefed it to Air Force Headquarters and the Joint Staff before introducing it to theater. The text of the briefing viewgraphs stopped just short of declaring that Instant Thunder alone would force Iraq to withdraw from Kuwait. The Checkmate planners appear to have believed that the conflict would require attacks on Baghdad and Iraq proper, and not solely, or even chiefly, on forces deployed in Kuwait.<sup>77</sup>

During one of the briefings to Chairman of the Joint Chiefs, General Colin Powell, Warden told him:

This plan may win the war. You may not need a ground attack... I think the Iraqis will withdraw from Kuwait as a result of the strategic air campaign.<sup>78</sup>

Schwarzkopf had very little ground assets in the theater at the time, so he liked the offensive nature of Instant Thunder and asked to have Warden go to Saudi Arabia to work for his Air Component Commander, Lieutenant General (LTG) Horner. LTG Horner did not like the plan, because he felt that it neglected the Iraqi forces in Kuwait. Horner, like his superiors, understood that any war in the Persian Gulf would have to culminate with a ground offensive to finally liberate Kuwait and evict the Iraqi army. He was a firm believer that air power was a system within the system of the U.S. military, and not a preeminent force all by itself:

Horner had never read Warden's book on air campaigns, but he was weary of his brethren in blue who made sweeping claims for Air Force hegemony. "Air power airheads," he called them.<sup>79</sup>

Horner sent Warden back to the U.S. and placed Brigadier General Buster Glosson in charge of planning the offensive air campaign. The campaign plan Glosson and his staff developed centered on attacking three key centers of gravity. These were the Iraqi National Command Authority, Iraq's nuclear, chemical and biological capability, and the Republican Guards command.<sup>80</sup> These centers of gravity on which the air planners planned to focus supported the theater military objectives:

- \* Attack Iraqi political/military leadership and command and control.
- \* Gain and maintain air superiority.
- \* Sever Iraqi supply lines.
- \* Destroy chemical, biological, and nuclear capability.
- \* Destroy Republican Guards forces.
- \* Liberate Kuwait.<sup>81</sup>

The air plan mirrored the four phases of CENTCOM's plan. Phase I, the strategic air campaign, was designed to attack strategic targets within Iraq. Phase II, air supremacy in the Kuwait Theater of Operations (KTO), was designed to establish air supremacy in the KTO. Phase III, battlefield preparation, was designed for tactical strikes on Iraqi ground forces to reduce their effectiveness prior to the ground offensive. Phase IV, the ground offensive campaign, planned to have massive amounts of close air support and interdiction missions to directly support the ground offensive. Throughout phases two through four, strategic attacks would continue, but at a lower scope. The Air Force, in the form of Chief of Staff General McPeak, stated that the air campaign would reduce the Iraqi forces in Kuwait by fifty percent.<sup>82</sup> Glosson told Schwarzkopf later:

It doesn't matter what the ground attack plan is. Whatever you come up with will work because the enemy will have been so reduced from the air.<sup>83</sup>

The air campaign ran according to plan and appeared to be meeting with great success. The coalition air forces quickly established air supremacy in the KTO. Strategic targets were attacked repeatedly without much friendly losses. However, The ground commanders were not pleased with the amount of sorties addressing the Iraqi forces opposite them. Schwarzkopf agreed, and instructed Horner to begin the battlefield preparation phase even though the air planners felt that the strategic targets were still a priority. Even after the air attacks on Iraqi ground forces had taken their effect, there was plenty of evidence that the Iraqis had the means and the will to resist the ground attack:

The artillery raids and reconnaissance patrols revealed that while some of the Iraqi forces were demoralized and devastated, most of them intended to stay put and fight.<sup>84</sup>

Once the ground campaign began, the coalition forces quickly punched through Iraqi front line units and chased much of the Republican Guards units out of Kuwait. If there was any doubt about the will of the Iraqis to fight, one has only to look at the violent armor battles that raged at places like Khafji, and the 73 Easting. The ground offensive worked for a number of reasons, to include the application of air power. However, the primary reason the ground campaign worked was due to the equipment, training, and performance of the soldiers and Marines who crossed the line of departure to close with and destroy the enemy:

Here could be seen, with almost flawless precision, the lethality of modern American weapons; the hegemony afforded by Airland Battle doctrine, with its brutal ballet of armor, artillery, and air power; and not least, the elan of the American soldier, who fought with a competence worthy of his forefathers on more celebrated battlefields in more celebrated wars.<sup>85</sup>

The air campaign accomplished what Powell, Schwarzkopf, and Horner expected of it. It established air supremacy, disrupted Hussein's command and control, and reduced the combat and logistics effectiveness of the Iraqi ground forces. More importantly, it set the conditions that allowed for a successful ground campaign to push the Iraqi army out of Kuwait. The air campaign did not live up to the expectations of men like Warden and Glosson. The Iraqi army stayed put and mostly fought back. Hussein's command and control infrastructure was disrupted, but not broken. The Iraqis were able to control SCUD strikes into Israel and Saudi Arabia throughout the air campaign.<sup>86</sup> Finally, certain Republican Guards units began withdrawing on the day the allied ground offensive began, an act that was impossible without some sort of command and control link with Baghdad:

Even against Iraq, the impact of the air campaign was mixed and bitterly debated. A two-year independent study commissioned by the Air Force would find little evidence that strategic attacks against Baghdad and other targets north of the Euphrates had been critical in the allies' ultimate success. Despite destroying nearly all of Iraq's petroleum refining capacity, for example, such attacks "bore no significant military results" - in part because the war did not last long enough for fuel shortages to severely hamper enemy forces. Also, despite 840 attacks against leadership and other command-and-control targets, Saddam was still alive and his regime still in power. On the other hand, 22,000 strikes against the Iraqi army- although failing to reach Schwarzkopf's goal of fifty percent destruction before the ground offensive began- had clearly battered the enemy to near senselessness.<sup>87</sup>

#### **IV. Current Trends and a Possible Future**

Since Desert Storm, the U.S. has continued to use air power in a variety of ways. Air power is an integrated part of the whole of the U.S. arsenal. By looking at some current trends, it is possible for us to understand what the future holds for air power and its ability to win alone.

The United States is currently the only remaining superpower. There is literally no air force in the world at the current time that can physically match the air power of the U.S.. Subsequently, the U.S. can be assured of air superiority anywhere it operates. This is nothing new. The U.S. Army operated under the protection of air superiority in North Africa and Western Europe in World War II. It has enjoyed such a luxury in Korea, Vietnam, Grenada, Panama, and Desert Storm. However, past events have shown that air superiority is no guarantee of victory. Our own bitter experience in Vietnam demonstrated this, as does the Soviet experience in Afghanistan.

Recent experience in undeveloped countries where government has failed and apparent anarchy reigns has presented some new problems for air power employment. In Somalia, a country with no air force at all, we naturally obtained air superiority when we arrived. However, there were no strategic or operational targets to strike once the mission turned violent. Even the employment of tactical air would have been severely limited, because the majority of engagements took place in the crowded streets and alley ways of the cities. The same problem presents itself in places like Rwanda, where the "bad guys" are "low tech," and use refugee camps and cities for sanctuary. The very devastating nature of air power prohibits its use in such situations.

Perhaps the most common use for U.S. air power in recent time is for deterrence and coercion. As the U.S. military grows smaller in the aftermath of the Cold War, it has ceased being a forward deployed military and relies more on force projection. In the past where a physical presence of the U.S. military was possible to deter aggression, we must use air power to act as that deterrent. Deterrence through air power has taken several forms. On many occasions, the U.S. has deployed aircraft carriers into a region to deter aggression through the threat of using air power. On other occasions, the U.S. has deployed ground based aircraft to a region as a form of deterrence. Also, by possessing the strategic capability to strike anywhere in the world with air power, many would be aggressors must think twice before encroaching on U.S. security concerns. Not only does this capability include the obvious ability to strike out with combat aircraft, it includes the ability to rapidly air lift and air drop ground troops into a region. The rapid deployment of U.S. ground forces to Grenada in 1983 and Panama in 1989 relied on strategic air power to get the ground forces into the theater. This combined ability to deploy combat aircraft and ground forces by air in a matter of hours to anywhere in the world is a significant deterrent capability.

Coercion through the use of air power has been significant in recent operations. The U.S. was able to force warring factions in former Yugoslavia to comply with UN resolutions regarding heavy weapons by using air strikes to destroy the items if they were not properly stored or turned over to UN authorities. Air power has been successfully enforcing *no fly zones* over Iraq since the Gulf war to prevent Iraq from using its air power in an overt manner against its own people or neighbors. More recently, when

Saddam Hussein refused to allow UN weapons inspectors to continue to look in suspected areas for weapons of mass destruction or the equipment to manufacture them, a rapid build up of U.S. air power in the region for a massive strike brought about international attention and ultimate compliance with the UN mandate.

As stated earlier, the U.S. is the only superpower. As such, it can afford the luxury of maintaining a considerable strategic air capability. Since few nations can hope to match such power, they must combat it asymmetrically. Although many nations may not possess the technical or industrial capability to produce weapons to combat U.S. air power, they may purchase first class weaponry from countries who do have the capability to produce such weapons. Some countries who possess such a capability may even give such weapons to a less capable nation to combat U.S. air power if it is in there best interest. During the Soviet invasion of Afghanistan, the freedom fighters used American-made Stinger antiaircraft missiles to defeat Soviet air power, forcing the Soviets to come after them in their mountain sanctuaries where mechanized forces were rendered vulnerable in the rugged terrain.<sup>88</sup> Other asymmetrical means may involve terrorist activity in the U.S. or at U.S. military installations abroad. Nations without the ability to symmetrically attack the U. S. with strategic weapons could possibly rely on terrorist style attacks against targets in the U.S. and claim that such attacks are *legal* because the weaker nation is strategically attacking the U.S. in an asymmetrical manner. Backed by an effective informational campaign, such actions could gain world wide credibility among many smaller nations. Conversely, nations without the strategic weapons to attack the U.S. or its air bases in sanctuary could charge that U.S. pilots were conducting

terrorist attacks against them and subsequently treat any downed American pilots as criminals rather than legitimate uniformed service members. Other methods of asymmetrically countering U.S. air power may include guerrilla or commando style raids on U.S. air bases much like North Vietnam did by using Vietcong to attack American bases in South Vietnam. Another more recent example of a country or entity lacking air power that uses asymmetrical means to counter superior air power occurred in former Yugoslavia. Bosnian Serbs chained UN peacekeeping soldiers to likely targets for NATO aircraft to prevent further NATO air strikes. This act was broadcasted on television news spots, and effectively halted the air strikes until the hostages were released through diplomatic initiatives. Planners must be wary of possible asymmetrical means available to an opponent to counter the application of air power, just as planners must be aware of the SAM and fighter aircraft capabilities of a peer or near peer opponent.

The bottom line is that air power must be flexible enough to meet the needs of the nation throughout the entire spectrum of conflict from peace operations to high intensity conflict with a peer opponent. This may include deterrence and coercion, or a complete air campaign. Recent operations have shown that some situations are well suited for air power to be very effective in this role, while other situations can barely or credibly be affected by air power. Planners must be aware that, like ground operations, each situation short of total war is different and requires a wide range of options. A standard cookie cutter approach to all situations will not work, because there may not be a *center of gravity* that air power can attack.

## V. Conclusion

This monograph has the task of answering a primary question and two supporting questions. The primary question asks if air power can win a war by itself. The supporting questions ask if a nation can win a war without superior air power, and if the will of a nation to fight can be broken from the air.

This monograph studied the employment of air power in six campaigns during four major conflicts, and found no conclusive evidence that air power can win a war by itself. In fact, most of the historical evidence found discussed the incredible effectiveness of air power employed in a tactical role, but many sources questioned the strategic contribution made by air power:

Pilots also had an unfortunate tradition of overpromising, as exemplified by Claire Chennault's boast to Franklin Roosevelt in 1942 that with just 150 fighters and forty-two bombers he could "accomplish the downfall of Japan." In the same year, the British air marshall, Arthur (Bomber) Harris, had predicted that the razing of German cities would effect the destruction of Nazi industry and morale. Yet the country's fighting spirit remained intact, industrial production continued to rise for two more years, and the national telephone system worked even as Red Army troops smashed through the suburbs of Berlin. Strategic Bombing in 1945 was discredited and, in some quarters, condemned as an atrocity.<sup>89</sup>

The monograph discussed some historical precedents for nations with little or no air power, much less superior air power, being able to achieve victory. One of the quotes in the beginning of the monograph from John Warden emphatically states that no nation has ever won a war, since 1939, without superior air power, and no nation has ever executed a successful defense without it. However, the monograph highlighted two wars where the opposite took place. North Vietnam ultimately won, and had no air force that could seriously challenge the United States. The Soviet Union was ground down by a

war of exhaustion in Afghanistan by guerrilla fighters who completely lacked an air force. In both cases, the two nations with the most powerful air forces in the world had to concede defeat and leave after losing the will to continue fighting. However, the failure of air power theorists such as Warden to appreciate the lessons learned from such conflicts and apply them continues. The foreword to Dr. Earl H. Tilford's book, *Setup* (published by the Air University Press at Maxwell Air Force Base), has this to say about air power advocates and how they view air power in light of its experience in Vietnam:

The USAF's uncritical approach to it's own past has enabled it to declare strategic bombing decisive where it was not (Europe, 1943-45); to claim victory where there was none (Vietnam, 1972); and to neglect those air operations that, indeed, proved indispensable and potentially decisive (tactical air campaigns in the European and Pacific theaters during World War II and Korea during 1950 and 1951). This inability of the USAF to assess realistically the lessons and implications of its wartime experiences-failures along with successes-not only keeps it from facing the more difficult and sometimes painful implications of the Vietnam experience, but in the long run enervates all Air Force doctrine, strategic as well as tactical.<sup>90</sup>

The final question looked into the idea that a nation's will to fight could be attacked and destroyed from the air. The idea that air power alone can destroy the will of a nation to continue a war is an integral part of the theories proposed by Douhet, de Seversky, Mitchell, and Warden. In each of the cases studied in the monograph, there has not been one incident of a nation losing its will to fight because it has been relentlessly and effectively attacked from the air. On the contrary, the campaigns and conflicts studied in this monograph show that, in most cases, the will of the people to fight back actually *increased* as a result of air attack.

Colonel Phillip S. Meilinger, a major contributor to The School of Advanced Air Power Studies literature, best supports the lessons learned from this monograph:

One of the distressing traits of airpower theorists is their tendency to claim too much for their chosen weapon. Airpower does not have to win wars *alone* in order to be decisive, any more than does an army. True unification-what today we would call “jointness”-recognizes that all weapons and services have unique strengths and weaknesses. Wise commanders choose those weapons and capabilities that will most effectively and efficiently accomplish their objectives.<sup>91</sup>

Air power is a system within the system that is the U.S. military arsenal. Ground, naval, and air forces complement each other, and depend on each other to win wars. The United States military fights at the joint level. It uses combined arms to create a synergistic effect that leads to rapid victory with minimal bloodshed to friendly and enemy forces. The U.S., as the world’s only current superpower, faces many threats and military obligations on a global level. In order to meet such challenges, it must be able to respond across the entire spectrum of conflict from low intensity peace operations to high intensity war with a future peer opponent. Military and civilian planners and leaders must recognize the joint doctrine with which our nation’s military operates, and understand the true capabilities and limitations of each arm in order to secure victory and avoid the military disasters of the past. Therefore, any attempt to suggest that a single arm can prevail is unrealistic and irresponsible.

## ENDNOTES

<sup>1</sup> Giulio Douhet, *The Command of the Air*, (Washington: Office of Air Force History, 1983), 50-51.

<sup>2</sup> Ibid., 94

<sup>3</sup> Ibid., 58.

<sup>4</sup> Ibid., 5-10.

<sup>5</sup> Ibid., 8.

<sup>6</sup> Ibid., 22.

<sup>7</sup> Alexander P. de Seversky, "Ten Air Power Lessons For America," *Flying and Popular Aviation*, (July, 1941): 14.

<sup>8</sup> Phillip S. Meilinger, *The Paths of Heaven* (Maxwell AFB, Alabama: Air university Press), 253.

<sup>9</sup> Alexander P. de Seversky, *Victory Through Air Power*, (New York: Simon and Schuster), 145.

<sup>10</sup> Meilinger, 252.

<sup>11</sup> William Mitchell, *Memoirs of World War I: From Start to Finish of Our Greatest War* (New York: Random House, 1960), 59

<sup>12</sup> Meilinger, 86.

<sup>13</sup> Ibid., 87.

<sup>14</sup> Ibid., 97

<sup>15</sup> John A. Warden, *The Air Campaign*. (Washington: National Defense University Press), 13.

<sup>16</sup> Ibid., 11

<sup>17</sup> Meilinger, 372-373.

<sup>18</sup> Gordon Wright, *The Ordeal of Total War*, ( New York: Harper Torch Books, 1968), 29.

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<sup>19</sup> Ibid.

<sup>20</sup> Richard Hough, and Denis Richards, *The Battle of Britain*, (New York: W.W. Norton and Company, 1989), 307.

<sup>21</sup> Ibid., 304

<sup>22</sup> Wright, 29.

<sup>23</sup> Winston S. Churchill, *The Second World War, Volume 2: Their Finest Hour*, (New York, Houghton and Mifflin Company, 1949), 330-331.

<sup>24</sup> Hough and Richards, 309-311.

<sup>25</sup> Haywood S. Hansel, *The Air Plan That Defeated Hitler*, (Atlanta, GA: Higgins-McArthur/Longino and Company, INC., 1972), 200.

<sup>26</sup> Wright, 176.

<sup>27</sup> Ibid., 177.

<sup>28</sup> Ibid., 180.

<sup>29</sup> Hansell, 183.

<sup>30</sup> Ibid., 171.

<sup>31</sup> Ibid., 165.

<sup>32</sup> Ibid., 168.

<sup>33</sup> David MacIssac, *The United States Strategic Bombing Survey: Volume I*, (New York: Garland Publishing, 1976), 8-10.

<sup>34</sup> Ibid.

<sup>35</sup> Ibid., 1.

<sup>36</sup> Wright, 180-181.

<sup>37</sup> Churchill, 541.

<sup>38</sup> Wright, 181.

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<sup>39</sup> Ibid., 181.

<sup>40</sup> *The United States Strategic Bombing Survey* provides a wealth of data gained after the war on the effects of the Allied air war on Germany. It contains volumes of charts, graphs, questionnaires, and interviews. The raw data alone is fascinating to review. However, one must keep in mind that the authors had an ulterior motive. This motive was to provide supportive evidence for the argument for a separate Air Force in the U.S. military structure. This is key to keep in mind when reading many of the conclusions the authors draw from the data they collected. The level of destruction carefully researched and annotated in the survey is impressive and valuable when reviewing the air war over Germany. However, the actual effects achieved through strategic bombing as discussed in the survey are somewhat subjective when compared to other resources. One of the more objective reports on the air war over Germany is *The Strategic Air Offensive Against Germany 1939-1945*. This three volume series is the official UK history of the Air War, and the author found it to be a very objective account. The best explanation for this is that England already had a separate air force in the form of the RAF when it entered World War II. For this reason, its authors had no reason for embellishing the role of the RAF in the defeat of Germany.

<sup>41</sup> Charles Webster, *The Strategic Air Offensive Against Germany: 1939-1945*, (London: Her Majesty's Stationery Office, 1961), 288-289.

<sup>42</sup> MacIssac, 8.

<sup>43</sup> Marshall Andrews, *Disaster Through Air Power*, (New York: Rinehart and Company, INC., 1950), 4

<sup>44</sup> Ronald H. Spector, *Eagle Against the Sun: The American War With Japan*, (New York: Vintage Books, 1985), 491.

<sup>45</sup> Ibid. Japanese shipping was especially vulnerable to submarines and airplanes because the Japanese refused to use the tried and true tactic of convoys.

<sup>46</sup> Ibid., 504.

<sup>47</sup> Ibid., 542

<sup>48</sup> Ibid., 548

<sup>49</sup> The Japanese considered their emperor to be the sole earthly representative of heaven. This is what allowed a seemingly gentle race of people to commit the atrocities attributed to them in China. If the emperor sanctioned a war, it had the blessing of heaven.

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<sup>50</sup> Spector, 555.

<sup>51</sup> Ibid.

<sup>52</sup> Richard H. Kohn and Joseph Hanrahan, *Strategic Air Warfare*, ( Washington: Office of Air Force History, 1988), 70.

<sup>53</sup> Marshall Andrews, *Disaster Through Air Power*, ( New York: Rinehart and Company, INC., 1950), 4.

<sup>54</sup> Clay Blair, *The Forgotten War*, (New York: Times Books, 1987), 975.

<sup>55</sup> Max Hastings, *The Korean War*, (New York: Touchstone Books, 1987), 256.

<sup>56</sup> Ibid., 266.

<sup>57</sup> Ibid., 255.

<sup>58</sup> Ibid., 268.

<sup>59</sup> Ibid., 268.

<sup>60</sup> James T. Stewart, *Air Power: The Decisive Force in Korea*, ( Princeton, NJ: D. Van Nostrand Company, INC., 1957), iii.

<sup>61</sup> Hastings, 269.

<sup>62</sup> Stanley Karnow, *Vietnam*, ( New York: Viking Press, 1983), 415.

<sup>63</sup> Ibid., 439.

<sup>64</sup> John T. Smith, *Rolling Thunder: The Strategic Bombing Campaign, North Vietnam 1965-1968*, (St. Paul, MN: Phalanx Publishing Company, 1995), 211.

<sup>65</sup> Karnow, 454 and 498.

<sup>66</sup> Ibid., 435.

<sup>67</sup> Smith, 103.

<sup>68</sup> Earl H. Tilford, *Setup: What the Air Force Did in Vietnam and Why*, (Maxwell AFB, Alabama: Air University Press, 1997), 234.

<sup>69</sup> Ibid., 255-257.

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<sup>70</sup> Mark Clodfelter, *The Limits of Air Power*, ( New York: The Free Press, 1989), 195.

<sup>71</sup> Karnow, 653.

<sup>72</sup> Clodfelter, 200.

<sup>73</sup> Tilford, 297.

<sup>74</sup> Ibid., 289.

<sup>75</sup> U.S. News and World Report, *Triumph Without Victory: The Unreported History of the Persian Gulf War*, ( New York: Times Books, 1992), 152.

<sup>76</sup> Ibid.

<sup>77</sup> Thomas A. Keaney and Eliot A. Cohen Editors, *Gulf War Air Power Survey Summary Report*, (Washington: United States Department of Defense, 1993), 37.

<sup>78</sup> Rick Atkinson, *Crusade*, ( Boston: Houghton Mifflin Company, 1993), 60.

<sup>79</sup> Ibid., 61.

<sup>80</sup> Keaney and Cohen, 39.

<sup>81</sup> Ibid..

<sup>82</sup> Ibid. The figure of fifty percent was driven by army planners on the CENTCOM staff. The army planners originally expected to execute the ground offensive with only one army corps, and calculated that air power would need to eliminate fifty percent of Iraqi armored vehicles and artillery for the ground attack to be successful. The figure of fifty percent reduction remained a planning figure even after a second army corps was designated to participate in the ground offensive.

<sup>83</sup> Atkinson, 64.

<sup>84</sup> James Blackwell, *Thunder in the Desert*, (New York: Bantam Books, 1991), 183.

<sup>85</sup> Atkinson, 448.

<sup>86</sup> U.S. News and World Report, 246-247.

<sup>87</sup> Atkinson, 494-495.

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<sup>88</sup> Richard H. Schulz, *The Future of Air Power in the Aftermath of the Gulf War*, (Maxwell AFB, Alabama: Air University Press, 1992), 174.

<sup>89</sup> Atkinson, 57.

<sup>90</sup> Tilford, ix.

<sup>91</sup> Meilinger, 269.

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